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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Commercial vehicles and buses — Mounting dimensions for starter motors of types 1, 2, 3 and 4

Véhicules utilitaires et autobus — Dimensions de montage des démarreurs de types 1, 2 ,3 et 4

Reference number
ISO 7650 : 1987 (E)

Foreword

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International Standard ISO 7650 was prepared by Technical Committee ISO/TC 22, *Road vehicles.*

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Commercial vehicles and buses — Mounting dimensions for starter motors of types 1, 2, 3 and 4

1 Scope and field of application

This International Standard lays down the mounting dimensions for interchangeability of starter motors mounted on internal combustion engines in commercial vehicles and buses.

It applies to starter motors, types 1, 2, 3 and 4, sizes "A" and "B"; it may be used for other engine applications where no specific standards exist.

2 Reference

ISO 8123, *Road vehicles — Starter pinions of diametral pitches.* [1)]

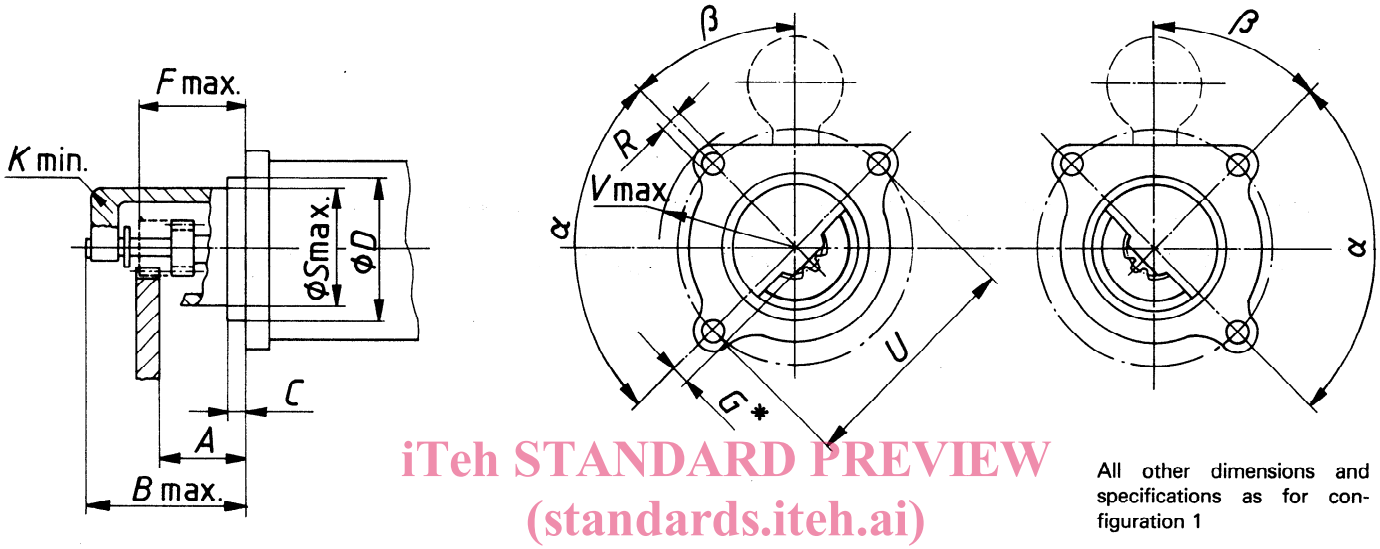
1) At present at the stage of draft.

3 Dimensions and tolerances

3.1 General dimensions

3.1.1 Starter motors with nose support bearing

3.1.1.1 Starter motor sizes "A" and "B", type 1



Configuration 1

All other dimensions and specifications as for configuration 1

Configuration 2
(alternative)

* Dimension *G* shall not exceed the root radius of pinion teeth (see ISO 8123).

Figure 1 — Starter motor with nose support bearing, type 1

Table 1

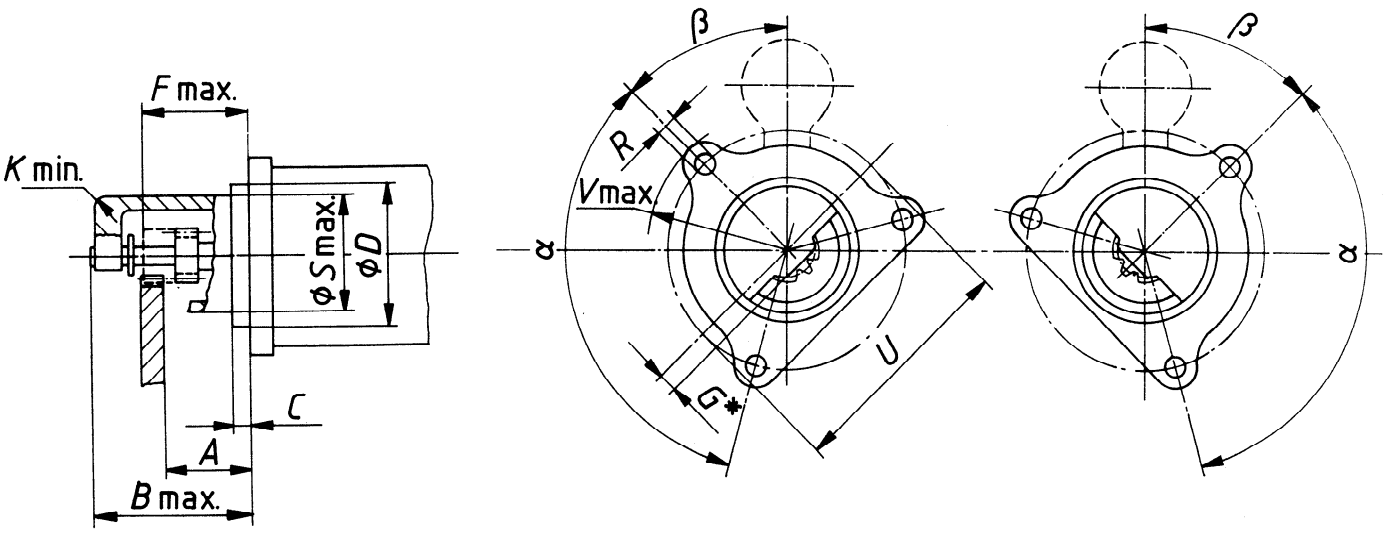
Dimensions in millimetres

Dimension / Size	*A* ±1	*B* max.	*C*	*D*[1]	*F* max.	*K* min.	*R* H13	*S* max.	*U* ±0,15	*V* max.	*α* ±30′	*β*[2] ±2°
A	51	98	5 to 9	89	68	6	11	*D* − 0,7	127	80	90°	45°
B	24	72	5 to 9	89	39	6	11	*D* − 0,7	127	80	90°	45°

1) Tolerance classes: see 3.2.

2) The value of angle *β* specified in the table is the preferred value. Other values shall be agreed between engine and starter motor manufacturers.

3.1.1.2 Starter motor sizes "A" and "B", type 2



Configuration 1

All other dimensions and specifications as for configuration 1.

Configuration 2
(alternative)

* Dimension G shall not exceed the root radius of pinion teeth (see ISO 8123).

Figure 2 — Starter motor with nose support bearing, type 2

Table 2

Dimensions in millimetres

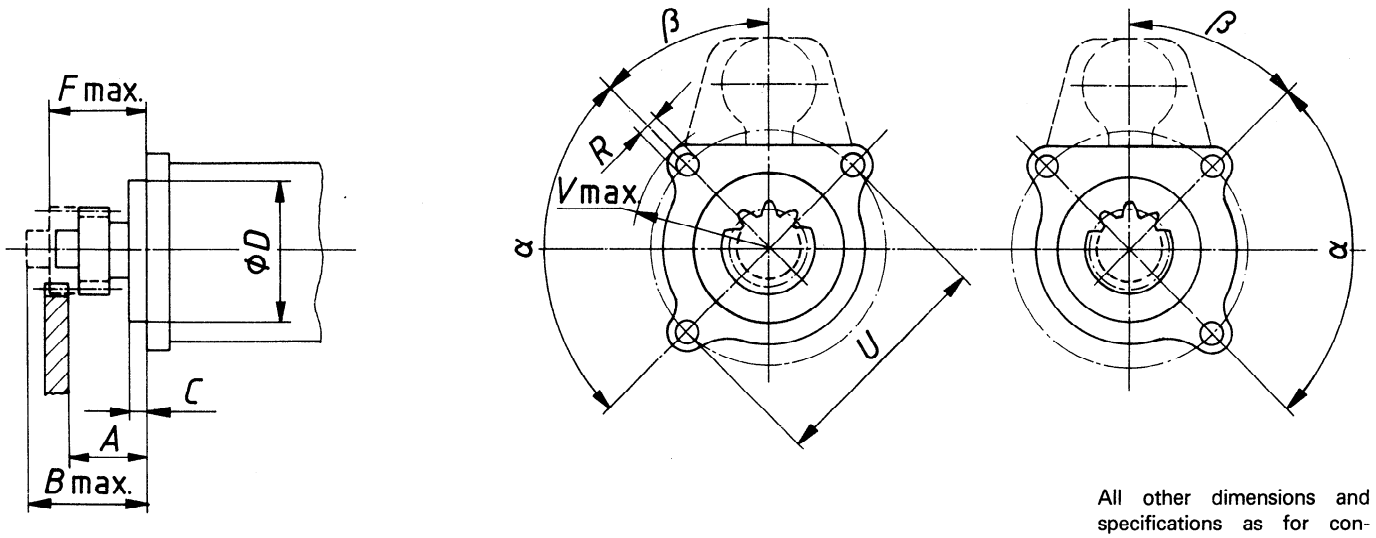
Dimension / Size	A ±1	B max.	C	D[1]	F max.	K min.	R H13	S max.	U ±0,15	V max.	α ±30′	β[2] ±2°
A	51	105	5 to 9	92	75	6	13,5 17	D − 0,7	146	90	120°	45°
B	24	78	5 to 9	92	48	6	13,5 17	D − 0,7	146	90	120°	45°

1) Tolerance classes: see 3.2.

2) The value of angle β specified in the table is the preferred value. Other values shall be agreed between engine and starter motor manufacturers.

3.1.2 Starter motors without nose support bearing

3.1.2.1 Starter motor sizes "A" and "B", type 3



Configuration 1

All other dimensions and specifications as for configuration 1.

Configuration 2
(alternative)

Figure 3 — Starter motor without nose support bearing, type 3

Table 3

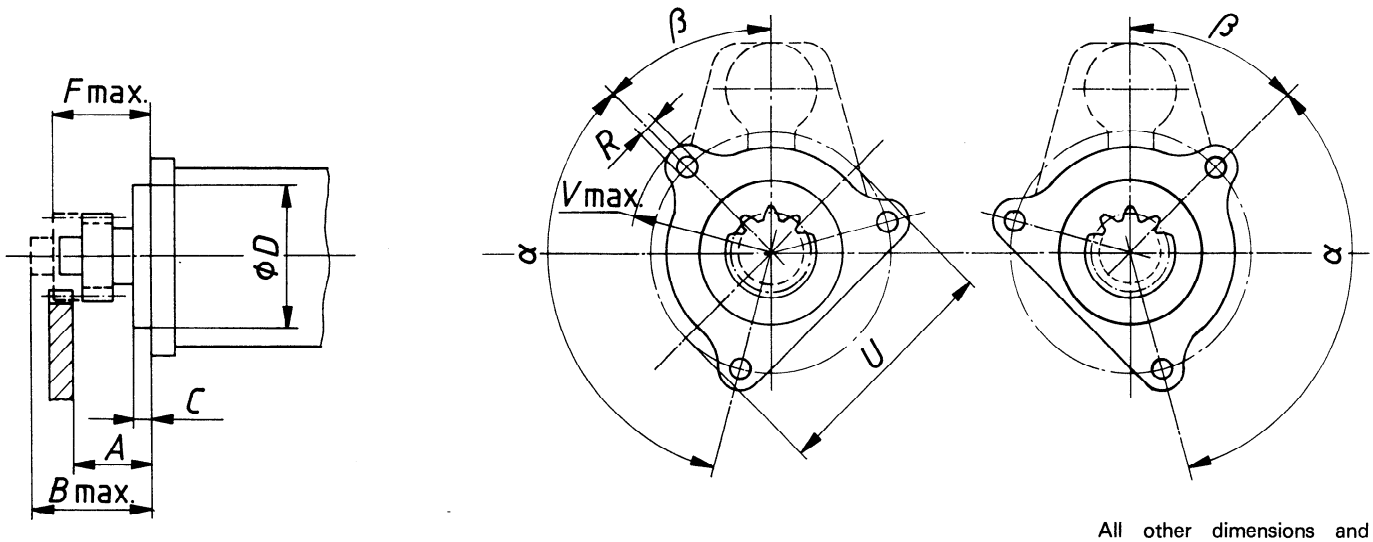
Dimensions in millimetres

Dimension / Size	A ±1	B max.	C	D[1]	F max.	R H13	U ±0,15	V max.	α ±30′	β[2] ±2°
A	51	88	5 to 9	89	75	11	127	80	90°	45°
B	24	72	5 to 9	89	48	11	127	80	90°	45°

1) Tolerance classes: see 3.2.

2) The value of angle β specified in the table is the preferred value. Other values shall be agreed between engine and starter motor manufacturers.

3.1.2.2 Starter motor sizes "A" and "B", type 4



Configuration 1

All other dimensions and specifications as for configuration 1.

Configuration 2
(alternative)

Figure 4 — Starter motor without nose support bearing, type 4

Table 4

Dimensions in millimetres

Dimension / Size	A ±1	B max.	C	D[1]	F max.	R H13	U ±0,15	V max.	α ±30′	β[2] ±2°
A	51	88	5 to 9	92	75	13,5 17	146	90	120°	45°
B	24	72	5 to 9	92	48	13,5 17	146	90	120°	45°

1) Tolerance classes: see 3.2.

2) The value of angle β specified in the table is the preferred value. Other values shall be agreed between engine and starter motor manufacturers.

3.2 Tolerance classes for the starter motor spigot diameters and the corresponding engine pilot bore diameters

The tolerance classes of the starter motor spigot diameters, depending on dimension D, are as follows:

d9 for D = 89 mm

js9 for D = 92 mm

Engine manufacturers are encouraged to use the following tolerance classes for the corresponding engine pilot bore diameters:

P8 for D = 89 mm

E8 for D = 92 mm

3.3 Other dimensions and specifications

Dimensions and requirements not given in this International Standard are left to the discretion of the manufacturer.

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Descriptors : road vehicles, commercial road vehicles, buses, internal combustion engines, engine starters, dimensions, connecting dimensions.

Price based on 5 pages